# Serial SEOs and capital structure

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## Abstract

This study investigates whether a firm's serial seasoned equity offerings (SEOs) have an impact on its capital structure that is distinct from that of a single SEO firm. Serial SEOs are pervasive in our sample of 1,033 UK public firms listed on the London markets. Some two thirds are serial SEO issuers—or have made more than one such issue—during the 1995–2015 sample period. Our findings show that that serial SEO firms have higher leverage ratios than single issuers, implying that the additional equity funds are not used to pay down debt. Moreover, they indicate that serial issuer cash holdings are sensitive to debt changes, but this is not the case with single issuers. Our findings highlight that serial SEO issue activity is an important determinant of changes in debt and cash holdings.

**Keywords:** Seasoned equity offering; serial issues; capital structure; debt capacity

**JEL classification:** G32, G31, G10

**EFM classification:** 140, 230, 240, 200

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## 1. Introduction

After an initial public offering (IPO), the issuing firm can and does typically return to the market to raise additional equity funds to finance their investment plans. These follow-on or seasoned equity offerings (SEOs) can either involve public offerings, private placements, or a combination of both. Prior studies have extensively explored these SEO deals from the perspective of stock liquidity (Butler et al., 2005; Lin and Wu, 2013), profitability (Fu, 2010), performance (Andrikopoulos, 2009; DeAngelo et al., 2010; Loughran and Ritter, 1995, 1997; Ngatuni et al., 2007; Spiess and Affleck-Graves, 1995; ) and how markets perceive them (Iqbal, 2008; Iqbal et al., 2013; Loughran and Ritter, 1997; and Walker et al., 2016). However, only a few researchers have explored serial or multiple SEOs by the same firm (D'Mello et al., 2003, Iqbal, 2008, Iqbal et al., 2013, and Walker et al., 2016).[1] These studies typically have focused on the short and long run performance aspects of these new SEOs. To our knowledge, the influence of multiple issues on corporate capital structure has yet to be explored, although it has potential to make multiple SEO issuers' capital structure significantly different from that of single SEO issuers. This difference may raise agency cost concerns for bondholders and potential investors.

In contrast to the extant literature, this paper examines the relationship between serial SEOs and the firm's capital structure. More particularly, it investigates whether the motivation for seeking additional SEO funds is to reduce existing debt, improve cash holdings, or both. It thus examines to what extent serial SEOs affect firm leverage ratios and whether there are differences in cash and debt management policies between serial and single SEO issuer firms. This study is based on a sample of 1,033 publicly-listed UK firms issuing equity during the 1995–2015 period and listed on the London Main Market (MM)

[1] We employ the concept of serial SEOs as it implies that the issues are conducted by the same firm whilst the term "multiple" equity issues can be ambiguous. The term frequent issues is also used in prior literature (see for example D'Mello et al., 2003) but that presupposes a short time span between serial issues.

or Alternative Investment Market (AIM). Typically, young firms with high growth prospects are attracted to the lightly regulated AIM (Vismara, 2012), while more established and larger firms issue equity on the MM. The conventional rationale for raising equity finance has revolved around the exercise of growth options where firms may, quite rightly, use the new equity funds to reduce their leverage (Hertzel and Li, 2010).

This paper establishes that serial SEO issuers have become a pervasive feature of the London markets. As such, studies that treat all SEOs as first issue fail to account for the reduction in information asymmetries and moral hazard that accompanies serial SEOs by the same issuer. Our data reveals that some two thirds (65%) of our sample are serial SEO issuers or have conducted more than one SEO during the sample period. Out of the 666 serial issuers, the majority (62%) are firms listed on AIM. On average, AIM firms issue equity 5.04 times while MM firms issue 4.15 times. By contrast, Iqbal et al. (2015) and Walker et al. (2016) find that their multiple SEO firms make an average of just 2.46 and 2.43 SEO issues, respectively, for samples that end in 2008 and 2012, respectively.

Our results indicate that serial SEO firms have higher leverage than single issuers. On average, serial issuers have higher growth and lower short-term to total-debt ratios. Serial issuers generally do not reduce their existing debt even though they have additional funds from issuing equity. This motivates us to investigate whether serial issuers have a different cash flow sensitivity of debt relative to single issuers. Our findings show that both serial and single issuers tend to increase their cash holdings when there is an increase in their cash flow. We further investigate whether such patterns differ between firms listed on London Main Market (MM) and firms listed on Alternative Investment Market (AIM). We find that AIM firms tend to increase their cash holdings when there is an increase in cash flow. Firms listed on MM, particularly for single issuers, change both their debt and cash holding positions when there is a change in cash flow. Finally, we examine the debt and

cash holding sensitivity to cash flow of financially constrained and unconstrained firms. We find that multiple and single issuers, both constrained and unconstrained, increase their cash holdings when cash flow increases. However, our results show that only constrained multiple issuers change their debt positions when there is a cash flow change.

Our study offers important insights into the nexus between SEOs—both serial and single—and capital structure. To the best of our knowledge, this study is the first to document evidence that serial issuers maintain higher debt levels than do single issuers, a pattern seen among firms both on the Main Market and on AIM. When additional cash becomes available, firms exhibit clear difference in their preferences between changing their debt or cash holdings. We also find differences in the ways MM and AIM firms employ new SEO injections of equity. While MM firms change both their debt and cash positions when they obtain new equity funds from SEOs, AIM issuers primarily focus on changing their cash holdings.

Our study contributes to the SEO literature on multiple equity offerings, highlighting the nexus between multiple equity offerings and capital structure. We consider that filling this gap in the literature is important, as raising financing has an impact on the capital structure of the issuing firm, even more so when a firm repeatedly returns to the markets to issue more equity as a serial issuer. Our work further provides practical implications; whether approaching from the position of an investor willing to invest in equity issued by single or serial issuers or from the position of the management of the equity issuers, our findings provide useful insight. First, serial issuers are more leveraged compared to single issuers, and this is a factor that a potential investor should take into consideration. Second, our results show that the market in which the issuing company is listed (MM or AIM in our case) plays a role in the sensitivity of cash holdings and debt positions when there is an increase in cash flow. Finally, our findings reveal that financial constraint can affect the use

of the equity proceeds raised, thus some firms may need to consider whether serial SEOs are the best choice for them.

The structure of the paper is as follows. Section 2 reviews relevant past studies and develops our hypotheses. Section 3 describes our sample and empirical methods. Section 4 discusses our empirical findings, and Section 5 summarizes and concludes.

## 2. Literature review and hypothesis development

### *2.1 Frequency of seasoned equity issues*

SEO firms can issue equity publicly via rights issues or open offers and/or privately with institutional investors via private placements or PIPEs (private investment in public equity). While there is no formal restriction on how many times firms can issue equity, they can choose to have multiple seasoned offerings only if they are assured by their advisors that the market will react positively to such announcements (Chakraborty and Gantchev, 2013; Loughran and Ritter, 1995, 1997; Ngatuni et al., 2007; Slovin et al., 2000; Spiess and Affleck-Graves, 1995). To achieve the final target of securing necessary funds at the best possible terms, the issuing firm may employ public equity issues or private equity placements, or a combination of the two.

Firms have alternative ways of getting access to funding, including bank loans and issuing debt instruments as well as raising equity. These financing outcomes dynamically affect firms' capital structure. While most previous studies have focused on analysis of a single type of external financing event, Billett et al. (2011) examine different types of external financing and explore firms' underperformance following external financing, providing new insights into raising different types of funds. They consider a range of external fund raising (IPOs, SEOs, bank loans, public debt offerings and private equity offerings) conducted by US firms and provide evidence that the use of multiple financing

patterns leads to worse performance than single events. Their results imply that underperformance is not necessarily caused by external capital raising. Rather, it is linked with the frequency and the variety of sources of external financing.

The prior literature has extensively explored different aspects related to SEOs. These include measuring SEO firms' performance and market reaction before, around and after the announcement of the SEO deal, exploring different factors that could explain the abnormal returns observed, examining discounts and their potential drivers around SEOs, and analysing the role of management and underwriters; the spectrum covered is vast (see for example Andrikopoulos, 2009; Chakraborty and Gantchev, 2013; DeAngelo et al., 2010; Hertzel and Smith, 1993; Loughran and Ritter, 1995, 1997; Ngatuni et al., 2007; Slovin et al., 2000; Spiess and Affleck-Graves, 1995). Each equity issue conducted by a firm is treated by most researchers as an independent event in their sample of events during the period examined. It remains an empirical question, however, whether these equity issue events are truly independent. Firm characteristics, including size, leverage, and growth, may change after each equity issue. Not all companies issue equity multiple times, either because it is too costly for them and/or because they have secured access to alternative sources.

Only a few studies have examined multiple equity issues, focusing mainly on the performance of frequent versus infrequent issuers and providing some interesting insights. D'Mello et al. (2003) examine the relation between the sequence of SEOs and announcement returns for 2,286 equity deals conducted by industrial, financial, and utility firms during 1979–1996. The results from the industrial subsample of firms show that, in each successive equity issue, investors react less negatively. The level of information asymmetry decreases each time a firm issues equity, and lower information asymmetry decreases the adverse selection costs investors face in an equity issue. This implies a less negative market reaction upon the announcement of a follow-on deal. D'Mello et al. claim

that equity issuers are aware of the information asymmetry decline and its advantages. Thus, during subsequent equity issues, firms both issue more capital and shorten the time period between successive SEOs.

Building upon and extending the work of D'Mello et al. (2003), Iqbal (2008) examines market reaction to the announcement of rights issues in the UK during 1988–1998, taking into consideration the sequence in which companies conduct multiple rights issue deals. He uses a sample of 569 rights issues by 243 UK firms in the industrial and financial sectors and finds that the negative market reaction after the announcement of the rights issues diminishes after the first and becomes insignificant after the third issue. His study provides evidence that the decline in information asymmetry is the reason behind the less negative market reaction at or after the third rights issue announcement. Relatedly, Iqbal et al. (2013) study the long-run performance of UK firms conducting multiple right issues between 1988 and 2008. Their analysis provides evidence that 53% of the rights issues in the UK are conducted by firms which make two or more issues during the sample period. They also find that companies issuing equity three times or more do not experience significant long-run underperformance. Their findings underline the importance of distinguishing between frequent and infrequent equity issuers as opposed to studying all equity issuing firms as a homogenous group.

The implication of the above studies is that investors perceive multiple SEOs as a signal of good quality and thus believe that investing in them is better than investing in single issuers. Reinforcing this argument, Walker et al. (2016) find that multiple SEOs can be used by equity issuing firms to build credibility with the market. Similar results were also found in Humphery-Jenner et al. (2018). Capital markets appear to have a long memory and reward or penalize an equity issuing firm when it returns to raise funds in a follow-on deal, based on the performance during its previous SEO. In other words, it is likely that

well-performing firms return to the market to raise additional financing which is in line with the results of Hovakimian and Hutton (2010).

Based on the above evidence, issuing equity multiple times sends a positive signal to investors on the quality of the issuing firm. The markets would not repetitively accept equity from poorly-performing firms. Additionally, multiple equity issuing can also be seen as a mechanism to build credibility and reduce the information asymmetry between firms and the market. By raising funds multiple times through SEOs, it is likely that an issuing firm will increase in size, become better known to investors and the markets, and be more extensively studied by market analysts than an infrequent issuer. Thus, the asymmetric information between the frequent equity issuer and investors might be reduced. However, once the prospectus and other floatation costs are considered, one might wonder whether repeatedly issuing equity is a costly way of reducing information asymmetries. In short, the issuance cost of equity depends on different factors. For example, the type of equity issue (public issuance of equity versus private placement of equity), the need (or not) to issue a prospectus and how extensive this document should be, the discount that the issuer will offer, how overvalued or undervalued is the firm and the market on which the equity issuing company is listed are all important variables.

Our study focuses on companies listed either on the London primary Main Market (MM) or the Alternative Investment Market (AIM). AIM, established in 1995, is a secondary exchange regulated market. It is a platform for small firms with good growth prospects to get listed in the IPO market and return to raise additional financing through SEOs. London MM and AIM tend to attract different companies with different financing and investment agendas (Doukas and Hoque, 2016). In the post-IPO period, AIM companies are more active in SEOs, while MM firms get involved in acquisitions, capital changes and dividend announcements. Also, many companies (UK and international) choose to list on

AIM because the listing and on-going costs are lower; AIM provides a light-touch regulatory approach to issuing firms. However, it is this regulatory approach that has created controversy regarding the quality of AIM as a listing platform. Though evidence shows that firms listed on AIM underperform in the long-run (Gerakos et al., 2013), AIM has gained popularity among firms throughout the world. These differences between London MM and AIM are the main reason we separately study these two markets.

Taking into consideration the differences between AIM and MM, this study explores the impact of serial equity issues by the same issuer on capital structure. Prior literature establishes that a non-negligible proportion of firms conduct SEOs (Iqbal et al., 2008, 2013; Walker et al., 2016). Based on the reported prior evidence our first hypothesis is:

*Hypothesis 1:* Serial equity issues have become pervasive on the London markets.

Compared to the Main Market (MM), firms in the AIM market are rather small and are generally considered to be more risky. It is, therefore, difficult for such firms to issue debt. However, they can employ the equity channel, especially Private Placements (PPs) of equity. As a result, our second hypothesis is:

*Hypothesis 2:* AIM firms are more active serial SEO issuers than firms on the MM.

### *2.2 Capital structure literature*

In the course of their operations, companies need financing for various purposes, such as investing in profitable (or not) projects, reducing debt, adjusting to optimal target leverage ratios, acquiring other firms, financing R&D, and covering working capital needs. The three main sources of financing that firms employ are: internally generated funds, debt, and equity. The prior literature has developed three different theories to explain how firms make decisions about their capital structure: pecking order, market timing, and trade-off theory. The pecking order theory, first developed by Myers and Majluf (1984), states that,

because it is the most costly, equity is the least-preferred method by which firms might acquire funds.

There is an extensive literature on the determinants of capital structure of firms. For example, Ozkan (2001) employs panel data and investigates the determinants of target capital structure as well as the role of the adjustment process for UK firms. He provides evidence that GMM estimation is more suitable than that of OLS when exploring potential determinants of capital structure. He finds that the sample UK firms have long-term target leverage ratios and that they adjust to these target ratios relatively quickly. He also establishes a negative relationship between liquidity, profitability, growth prospects, non-debt tax shields and the leverage ratios of firms. Brav (2009) conducts an important study on the firm-specific determinants of leverage. He finds evidence that the firm-specific factors that have previously been employed in the literature (profitability, growth prospects, capital expenditures, tangibility of assets, size of the firm, short-term to total-debt ratio and age) can explain the leverage of both private and publicly listed firms.

While firm-specific factors appear important in explaining the capital structure of firms, other factors may also play a role. Jong et al. (2008) study both firm- and country-specific factors affecting leverage in 42 countries. They find that several firm-specific factors (size of the firm, tangibility, growth, risk, profitability) do influence leverage but their primary focus is on the direct and indirect impact of country-specific factors on firms' corporate structures. The indirect impact of country-specific factors is related to how these factors affect firm-specific factors and, consequently, the choice of capital structure. Along similar lines, Gungoraydinoglu and Oztekin (2011) explore firm- and country-level determinants of capital structure in 37 countries. Using a comprehensive set of firm-specific variables as well as proxies for the firms' institutional environment, they find that firm-level covariates explain two thirds of capital structure variations, while country-level factors are

responsible for the remainder. Institutional factors that have an impact on bankruptcy costs and taxes may affect heterogeneity in capital structures across countries and are more relative to factors affecting agency and information asymmetry costs.

According to one stream of capital structure literature, firms have target leverage ratios and they try to adjust their positions to stay close to the leverage target. Different factors may affect the speed of adjustment to the optimal targeted leverage ratio. There are benefits but also costs to firms when adjusting their capital structures towards the target leverage. Ultimately, the firm's decision to adjust capital structure and its speed of adjustment depends on a cost-benefit analysis. Antoniou et al. (2008) study the choice of capital structure choice in bank- and capital-market oriented economies. They find that the size of the firm and tangibility of assets exhibit a positive relationship with leverage, while profitability, growth prospects and share price performance have a negative one in both types of economies. Their results also suggest that firms adjust leverage to stay close to their target capital structure. They conclude that both firm-specific factors as well as firms' economic environment affect their capital structure decisions.

Cook and Tang (2010) explore the impact of macroeconomic conditions on the speed of capital structure adjustment over a 30-year period and find that firms adjust their leverage toward the target leverage ratio more quickly when these conditions are good. Their findings are significant in light of the recent global financial crisis in which poor macroeconomic conditions may have left companies unable to quickly adjust their capital structure to reach their target leverage. Another important factor affecting capital structure and the speed of adjustment towards target leverage is the regulatory environment of the company. Along these lines, Oztekin and Flannery (2012) find that in their sample of 37 countries during 1991–2006, the effectiveness of the legal and financial institutions in a country affects the costs and benefits of converging toward the optimal target leverage ratio.

Another strand of the literature investigates the interaction between liquidity and leverage. One such recent study is that of Andres et al. (2014). They document a link between capital structure and information asymmetry. More specifically, they explore the impact that target capital structure decisions have on information asymmetries between the firms and the market. Information asymmetries are proxied by equity liquidity. Their results show that a decrease in leverage leads to a decrease in liquidity which, in turn, is interpreted as an increase in information asymmetry.

Since a firm's capital structure is related to its sources and uses of funds, our next testable implication is:

*Hypothesis 3:* Serial SEOs have an impact on a firm's leverage.

We further conjecture that there is a difference in capital structure between serial issuers and single issuers. Since serial issuers are likely to be higher risk, higher growth firms than single issuers and are more likely listed on the AIM than on the Main Market, they will likely employ the proceeds differently from single issuers. There is also the possibility that serial issuers are receiving stage finance as part of a program of growth and investment. The demand for cash holdings and for urgent debt reduction will differ between single issuers and serial issuers. Hence these two groups of firms are likely to employ the equity proceeds differently for debt reductions and cash holding increases. As such, serial issuers' cash flow sensitivity of debt and cash holdings are expected to be different than those of single issuers. This leads to our next hypothesis:

*Hypothesis 4:* Serial and single SEOs have different cash flow sensitivity of debt and cash holdings.

# 3. Sample, data and empirical methods

## *3.1 Sample of SEO deals*

Data on all follow-on or SEO deals by UK equity issuers are collected from the Thomson ONE database over the 1995–2015 period. Only SEO deals occurring in the UK public domain are included; IPOs and deals where only secondary shares are sold are excluded.[2] Our sample considers the main equity sources available to a firm on London's two markets, the Main Market (MM) and AIM.[3] After applying the above criteria, we match the sample with available Datastream data[4] to yield a sample of 1,263 UK issuers. Out of this initial sample of issuers, we exclude firms that do not have all the available accounting and market data needed for our analysis, leaving a final sample of 1,033 firms.

Table 1 shows the numbers of serial and single SEO firms and the average number of SEOs per firm on London's MM and AIM.[5]

[Table 1 around here]

More AIM-listed firms engage in SEOs (567) compared to those listed on MM (466). Taking both markets together, 65% of firms are serial SEO issuers and 35% are single SEO firms. It is interesting to note that serial SEO issuers are not simply an AIM characteristic. Indeed, the majority of firms on both markets are serial issuers, but the proportion on AIM is higher: 55% of MM and 73% AIM firms are serial issuers. This supports Hypothesis 1, that serial SEO issues have become pervasive. Overall, the average number of SEOs by serial issuers is 4.70. The mean number of serial issues on AIM (5.04) is larger than that on the MM (4.15), and the difference is statistically significant.

### *3.2 Baseline specification and variables*

Several studies have examined the determinants of leverage in different time periods

[2] We also exclude Units and Registration cases as well as Vendor placings.
[3] This means that we exclude from our sample 21 firms listed on PLUS, OFEX or there is no available information about their listing.
[4] SEDOL numbers as well as manual matching, where needed, are used.
[5] Strictly speaking, a single SEO firm may have conducted an SEO prior to the beginning of our sample period, but we are unable to check this with the available data. Walker et al. (2016) refer to these as first-in-sample SEOs to stress this point.

and markets. In this paper, we explore whether serial SEO issues play a role in determining the leverage of firms by employing an extension of the Brav (2009) methodology. The following baseline model is estimated:

$$Leverage_{i,t} = \beta_0 + \beta_1 Serial\ Issuers + \beta_2 ROA + \beta_3 Growth + \beta_4 CAPEX + \beta_5 Tangible\ Assets + \beta_6 Size + \beta_7 Short\ to\ Total\ Debt + \beta_8 Age + \varepsilon_{i,t} \quad (1)$$

where *Leverage* is defined as the ratio of book value of debt over market value of assets (market leverage). The *Serial Issuers* variable is a dummy that equals 1 if the firm has conducted more than one SEO during the sample period and 0 otherwise. Other explanatory variables include proxies for size, profitability and tangibility of assets. More specifically, these variables include return on assets (*ROA*), firm's *Growth* measured by turnover changes, capital expenditures (*CAPEX*), *Tangible assets*, firm's *Size* (measured by total assets), the ratio of short-term debt over total debt (*Short to Total Debt*) and the firm's *Age*. More detailed definitions for the independent variables are provided in Appendix A. The independent variables are lagged by one period to mitigate potential endogeneity issues. Our regressions include fixed effects for year and sectors at the two-digit SIC level.

Table 2 reports the descriptive statistics of the variables employed.[6] All the variables with the exception of the serial SEO dummy are winsorised at the 1% level on both tails. Columns 1 to 3 in Panel A contain information about the full SEO sample while columns 4 to 6 and 7 to 9 gives the details of serial and single issuers, respectively. Panel A reports statistics for means and medians for the whole sample as well as for serial and single issuers. Our discussion is primarily focused on these results. Panel B of Table 2 provides additional descriptive statistics on the distribution of the variables (minimum, maximum, standard

[6] The data have been winsorised at 1% level in both the tails of the distribution. As an additional check, we winsorised data at 2.5% in each tail (results not reported here). The results on average remain qualitatively the same.

deviation, and the values for the 5% and 95% percentiles) for serial and single issuers.

[Table 2 around here]

Over the sample period, serial SEO firms have significantly[7] higher average leverage (0.240) than do single SEO firms (0.214). Serial issuers enjoy higher growth (1.331 versus 1.260), poorer performance in terms of ROA (-0.084 versus -0.017), and a lower ratio of short term to total debt ratio (0.457 versus 0.483). All the latter differences are significant at the 5% level or better. These results indicate that serial SEO firms are highly leveraged firms that need to finance their growth prospects. The data show that serial issuers are significantly larger than single issuers (4.649 versus 4.608) when we look at average values, but the median values are very similar.

Table 3 provides additional information about the correlation of the variables used in our regression analysis. None of the correlation coefficients exceeds 0.5, so multicollinearity should not be an issue in our regression analysis.

[Table 3 around here]

The above findings show how serial and single issuing firms differ and motivate an investigation of whether serial issuers have a different cash flow sensitivity of debt compared to that of single issuers. Thus, we explore the impact of an increase in cash flow on the debt and cash holdings in these two subgroups of issuers. Empirically, we follow Acharya et al. (2007) and estimate the cash flow sensitivity of debt and cash holdings using a 3SLS (three-stage-least-squares) system of equations. This method combines 2SLS (two-stage-least squares) with SUR (seemingly unrelated regression). Its merit in this context is that it allows correlations of the unobserved disturbances across the different equations of

[7] The Welch approximation is used when t-statistics are calculated. Welch t-test is a modification of the Student t-test, which allows one to check if two sample means are significantly different without the assumption of equal variances and sample sizes.

the system. This methodology makes intuitive sense, because cash flow increases can be used to change debt positions, cash holdings, or both at the same time. The system of equations estimated is the following:

$$\Delta Debt_{i,t} = \alpha_0 + \alpha_1 Cash\ Flow_{i,t} + \alpha_2 Q_{i,t} + \alpha_3 Size_{i,t} + \alpha_4 \Delta Cash\ Hold_{i,t} + \alpha_5 Debt_{i,t-1} + \sum industr\ y_{i,t} + \sum ye\ ar_{i,t} + \varepsilon^{d}{}_{i,t} \quad (2)$$

$$\Delta CashHold_{i,t} = \beta_0 + \beta_1 Cash\ Flow_{i,t} + \beta_2 Q_{i,t} + \beta_3 Size_{i,t} + \beta_4 \Delta Debt_{i,t} + \beta_5 Cash\ Hold_{i,t-1} + \sum industr\ y_{i,t} + \sum ye\ ar_{i,t} + \varepsilon^{c}{}_{i,t} \quad (3)$$

where Δ*Debt* is defined as the ratio of changes in long-term debt over total book value of assets, while Δ*Cash Hold* is the ratio of changes in cash and equivalents over total assets. The definitions of all control variables can be found in Appendix A.

We first examine the sensitivity of debt and cash holdings to changes in cash flow for the overall sample as well as for the serial and single (SEO) issuer subsamples. We also explore the cash flow sensitivity of debt and cash holdings of serial and single issue firms listed on the Main Market and on AIM to test for a possible stock exchange impact. Finally, we test whether financially constrained serial issuers prefer higher cash to lower debt than do financially unconstrained serial issuers.

For the results of financially constrained versus unconstrained firms, we run the same set of regressions for serial and single issuers while we distinguish between constrained and unconstrained firms using three different methods. Firm size is the first proxy we use for financial constraints.[8] This approach sorts firms by asset size into deciles each year. Firms in the top (bottom) three deciles are deemed to be the unconstrained (constrained) firms. Two further proxies for financial constraints are used for robustness

[8] This approach is often used in literature with the rationale that, as firms grow larger, they are less likely to be financially constrained.

purposes: the dividend payout ratio and the SA (size-age) index developed by Hadlock and Pierce (2010). The former approach ranks firms by their dividend payout ratio—defined as dividends per share over earnings per share—into deciles each year. The firms in the top (bottom) three deciles are the unconstrained (constrained) firms. The SA index was developed by Hadlock and Pierce (2010). Its main underlying idea is that, as firms grow older and larger, they are less likely to be financially constrained. They find a linear relationship between age and constraints as well as a quadratic one between size and constraints. The index is calculated as:

$$SA\ index = (-0.737 * Size) + (0.043 * Size^2) - (0.040 * Age) \quad (4)$$

where age is the number of years a firm is listed while size is the natural logarithm of the inflation-adjusted book value of assets. We adjust for inflation by employing 2005 as the base year.

# 4. Empirical findings

## *4.1 Leverage for serial and single SEO issuers*

Table 4 presents the results of the determinants of leverage. Columns 1 and 4 give the results for the entire UK SEO sample while columns 2, 3 and 5, 6 report results for firms listed on the Main Market and on AIM, respectively. The variable of particular interest is the serial (SEO) issuer dummy. The results in columns 1 to 3 for our full sample indicate that the serial issuer dummy variable is significantly positive at the 1% level with a coefficient of 0.029. This implies that firms which serially engage in SEOs have higher leverage ratios. The serial issuer dummy has a significantly positive separate impact on AIM and MM firms at the 5% level with coefficients of 0.028 and 0.026, respectively. These results provide evidence that being a serial issuer has a positive impact on leverage of between 2.6% and 2.8% across these markets.

[Table 4 around here]

The return on assets (ROA) coefficient is significant negatively only for MM (-0.069) at the 5% significance level. The *Growth* variable is insignificant in all regressions. By contrast, the coefficients on capital expenditures (CAPEX) are significantly negative in all regressions, consistent with the trade-off theory. The tangibility of assets and size (with one exception) variables are always statistically significant and positive. These imply that firms with a higher proportion of tangible assets and larger firms tend to be more leveraged. Our results regarding the impact of size on debt ratios are in line with the findings of Brav (2009). The *Short-to-total Debt* ratio is significantly negative for the whole sample as well as in each of the two market subsamples. This finding implies that firms with a larger amount of short-term debt (due to be repaid back within a year) tend to have lower leverage. Finally, the results show a significantly positive relationship between age and debt ratios. However, the coefficients on age are significant for the aggregate sample and the AIM (but not the MM) subsample at the 1% level. This finding suggests that older firms in our sample tend to have higher leverage.[9]

As argued by Brav (2009), profitability may appear significant in the regression results not because it affects the debt ratios per se, but rather because it could move a firm's leverage away from the target leverage level (see also Hovakimian et al., 2001). Thus, we re-estimate our baseline model excluding the ROA variable. Columns 4 to 6 show that the serial issuer dummy remains significantly positive and that the economic impact remains very similar across the full sample as well as the MM and AIM subsamples. In other words, our results for serial issuers are robust to the inclusion or exclusion of the profitability

[9] The dependent variable in the regressions is market value leverage. However, the same set of regressions using book value (book value of debt/book value of assets) leverage (results not reported here) yields qualitatively similar results.

measure captured by ROA.

### *4.2 Cash flow sensitivity of debt and cash holdings*

Table 5 presents the results of the 3SLS regressions (Equations 2 and 3). Columns 1 and 2 show the results on the cash flow sensitivity for debt and cash holding changes for the entire sample. Columns 3 and 4 (columns 5 and 6) show the results of cash flow sensitivity of debt and cash holdings for serial (single) SEO issuers.

[Table 5 around here]

The full sample results show a positive and significant coefficient for cash flow in both the change in debt and cash holdings regressions. A similar pattern holds for the subsample of serial SEO firms, but the coefficient of cash flow for single issuers in the debt change regression is insignificant. The findings suggest that firms alter their debt and cash holding positions when they experience an increase in their cash flow. For the serial SEO sample, the coefficient of cash flow on the debt issuance regression is positive (0.015) but significant at the 10% level only. At the same time, the cash holding regression findings show that the cash flow coefficients are positive and significant at the 1% level in both the serial and single SEO subsamples (0.154 and 0.193 respectively). The results show that companies in both the subsamples increase their cash holdings following an increase in cash flow with a higher cash flow coefficient for single than for serial SEO issuers. Interestingly, serial issuers also alter their debt positions when there is a cash flow change.

Table 6 reports results for firms listed on the Main Market in columns 1 to 4 and on AIM in columns 5 to 8. We observe a similar pattern for the cash flow coefficient to that in Table 5. A change in cash flow for both serial and single SEO issuers listed on the MM leads to a change in their cash holding and debt positions. The cash flow coefficient is higher in the cash holdings regressions. These findings suggest that MM firms—both serial and

single SEO issuers—alter their debt and cash holdings following an increase in cash flow. However, the cash flow coefficients on debt for AIM firms are insignificant for both serial and single issuers. On the other hand, the coefficients in the cash holding regressions are positive and significant at the 1% level for both subsamples. These results suggest that AIM firms, which are usually small firms and considered risky compared to MM firms, tend to increase their cash holdings following an increase in cash flow. Taken together, the cash flow sensitivity of cash holdings for MM firms is higher than that for AIM firms. MM firms also exhibit significant cash flow sensitivity to net debt changes, particularly single issuers.

[Table 6 around here]

To summarise, our findings on sensitivity of cash holding and debt positions when there is an increase in cash flow reveal a different pattern for MM- and AIM-listed firms. MM issuers, both serial and in particular single ones, change both their cash holdings and debt positions when there is a change in cash flow. However, AIM-listed firms issuing equity once or multiple times tend to increase their cash holdings when there is an increase in cash flow without changing their debt positions.

### *4.3 Further analysis with financial constraints*

This section analyses whether financial constraints play a role in the sensitivity of debt and cash holdings to cash flow changes for serial and single SEO issuers. Table 7 uses firm size as a proxy for distinguishing financially constrained from unconstrained firms.

[Table 7 around here]

Panel A shows the results of cash flow sensitivity of debt for constrained and unconstrained firms in the aggregate sample (columns 1 and 2), serial issuers (columns 3 and 4) and single issuers (columns 5 and 6). Similarly, the results of the cash flow sensitivity of cash holdings are reported in Panel B. The Panel A results indicate that the coefficient on

cash flow is positive (0.028) and significant at the 5% level for constrained serial issuers but insignificant for unconstrained firms. This finding suggests that the relationship between cash flow and changes in debt is a positive one for constrained serial SEO firms. The results for the cash flow sensitivity of debt for the single issuer subsample are insignificant for both constrained and unconstrained firms. Financially constrained firms that issue equity multiple times seem to change their debt positions when there is an increase in cash flow. Panel B indicates a significantly (at the 1% level) positive relationship between cash holding and cash flow changes for both constrained and unconstrained firms for both serial and single issuers. Our findings suggest that serial and single issuers—irrespective of financial constraints—increase their cash holdings when there is an increase in cash flow.

Overall, our results suggest that single SEO firms, irrespective of financial constraints, increase their cash holdings rather than change their debt following a cash flow increase. The same applies for serial SEO firms. However, constrained serial issuers change both their debt and cash holding positions following an increase in cash flow. These findings are intuitive, since financially constrained firms that return multiple times in the markets to raise financing have an incentive to use some of the proceeds to improve their debt positions.

Since the prior literature has employed different methods for distinguishing financially constrained from unconstrained firms, we employ two additional methods in our analysis. Two additional proxies are used: the dividend payout ratio (Table 8) and the size-age index (SA index) (Table 9). Table 8 Panel A shows our findings for the cash flow sensitivity of debt for the entire sample (columns 1 and 2), serial issuers (columns 3 and 4) and single issuers (columns 5 and 6). The coefficient of cash flow is positive and statistically significant at the 5% level for constrained firms in the aggregate sample and in the subsample of serial SEO firms. The results for the cash flow sensitivity of cash holdings in Panel B of Table 8 are consistent with our findings in Table 7. The coefficient of cash flow

is positive and significant at least at the 5% level for the aggregate sample as well as for the serial and single SEO firm subsamples, irrespective of whether they are constrained or unconstrained.

[Tables 8 and 9 around here]

The SA index results are similar to those reported in Tables 7 and 8. Table 9 Panel A shows that the cash flow sensitivity of debt is positive for constrained firms in the aggregate sample as well as for serial SEO firms, as found previously. Interestingly, the cash flow coefficient now becomes significant for unconstrained firms in both the aggregate sample and the serial issuers subsample. Similar to our findings in Tables 7 and 8, the cash flow coefficients in Panel B of Table 9 are all positive and significant for all samples and for constrained and unconstrained firms. In other words, overall, our findings are robust to different methods of distinguishing financially constrained and unconstrained firms.

### *4.4 Alternative serial issuers dummy variable*

We now define the serial issuer dummy as taking the value of 1 if the company conducted more than one SEO after the current period and not over the full sample period 1995–2015; otherwise, the value is 0. The rationale for our new dummy is to capture the influence of the serial SEOs on capital structure in subsequent years.

The new set of results can be found in Table 10 while Table 11 gives corresponding results on the cash flow sensitivity of debt and cash holdings. The coefficient of the serial issuer dummy in Table 10 has positive impact leverage which is statistically significant only for the MM but not for AIM. The cash flow sensitivity of debt and cash holdings, on average, do not vary significantly in Table 11 when using the alternative for serial issuer definition. The coefficient of interest (Cash Flow) remains positive, but it is significant only in the cases of changes in cash holdings.

[Tables 10 and 11 around here]

This pattern is observed also when the analysis distinguishes between serial and single issuers on the MM versus AIM in Table 12. The one exception is single issuers listed on the MM where the cash flow coefficient is significant for both changes in debt and cash holdings. Serial and single issuers on AIM as well as serial issuers listed on the MM increase their cash holdings when there is an increase in cash flow. Single issuers listed on MM change both their debt and cash holding positions when there is an increase in cash flow. These results are consistent with our previous findings, implying that our results are not dependent on the serial issuer definition used.

[Table 12 around here]

The results based on our three different financial constraint proxies are reported in Appendix B: Tables B1, B2, and B3. The Cash Flow coefficient remains positive for changes in cash holdings irrespective of the definition used for serial issuers. Similarly, when the dividend payout ratio and SA index are used to distinguish financially constrained and unconstrained firms, the coefficient of the variable of interest remain qualitatively the same. The implication of this additional analysis is that our findings are robust to the alternative definition of the dummy variable for serial and single issuers.

## 5. Conclusions

This paper employs a sample of 1,033 UK firms over the 1995–2015 period to explore whether serial SEO issues have an impact on the companies' capital structure. Firms need financing for their operations, to fund their growth prospects and to make investments or reduce debt. Serial SEO issues confer upon firms the option to reduce their indebtedness at each issue. In this light, we investigate in this study whether serial issuers tend to have lower leverage ratios. Furthermore, we test whether serial issuers' capital structure differ

between AIM and MM firms. AIM firms are, on average, small companies (SMEs) and are considered to be riskier than firms listed on the MM.

We find that two thirds (65%) of the sample firms are serial issuers, confirming that serial SEOs have become a pervasive phenomenon. Of these, some three fifths (62%) are AIM firms. On average, an AIM firm conducts 5.04 SEOs and MM firms 4.15 SEOs, a difference that is statistically significant. Thus, results show that serial SEOs are not just an AIM phenomenon and confirm the rise of serial SEOs. Moreover, serial SEO firms have higher leverage ratios and growth rates but lower short-term to total-debt ratios relative to single issuers. These findings imply that serial issuers do not use the additional equity funds to reduce their short-term debt.

We further investigate the sensitivity of debt and cash holdings to changes in cash flow for both serial and single SEO firms. Our results show that both serial and single issuers increase their cash holdings following an increase in the cash flow. Moreover, serial SEO issuers change their debt positions when cash flow increases. AIM firms increase their post-SEO cash holdings when there is an increase in cash flow, while MM firms, particularly single SEO issuers, change both their corresponding debt and cash holding positions following a cash flow change. Finally, serial and single SEO issuers, whether constrained or not, increase their post-SEO cash holdings when cash flow increases. Our results are robust to fixed effects, different approaches to distinguish financially constrained and unconstrained firms, and an alternative definition of the serial SEO issuer dummy.

Our work contributes to the SEO and capital structure literature by highlighting the notion that serial SEOs have an impact on corporate capital structure, which is significantly different to single SEO firms' capital structure. Moreover, our study provides useful insights and implications for potential agencies. We show that serial issuers are more leveraged compared to single issuers, and this is a factor about which bondholders and potential

investors should be aware. In addition, the market in which the issuing company is listed plays a role in the sensitivity of cash holdings and debt positions when there is an increase in cash flow. Finally, our findings reveal that financial constraint conditions can affect the use of the equity proceedings raised, thus some firms may need to consider whether serial SEOs are in fact a better choice for them.

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**Table 1**
Serial and single SEO issuers.

| | N | | | Avg. no issues | | | t-diff |
|---|---|---|---|---|---|---|---|
| | All | MM | AIM | All | MM | AIM | AIM vs. MM |
| Serial SEOs | 666 | 255 | 411 | 4.7 | 4.15 | 5.04 | -3.22 |
| Single SEO | 367 | 211 | 156 | | | | |
| Total | 1,033 | 466 | 567 | | | | |

Note: This table shows the split between serial (serial issues dummy = 1) and SEO issuers for both the London Main Market and Alternative Investment Market 1995-2015. Single issuers are defined as firms which made one SEO during the sample period. Serial issuers are firms which have engaged in multiple SEOs.

**Table 2**
Descriptive statistics.

| PANEL A | Full sample | | | Serial issuers | | | Single issuers | | | *t*-diff |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | Mean | Median | N | Mean | Median | N | Mean | Median | (serial vs. single) |
| Serial SEOs (dummy) | 8,062 | 0.687 | 1 | - | - | - | - | - | - | - |
| Leverage (market) | 8,062 | 0.232 | 0.181 | 5,535 | 0.24 | 0.192 | 2,527 | 0.214 | 0.163 | -4.869 |
| ROA | 8,062 | -0.063 | 0.043 | 5,535 | -0.084 | 0.034 | 2,527 | -0.017 | 0.064 | 7.936 |
| Growth | 8,062 | 1.309 | 1.016 | 5,535 | 1.331 | 1.017 | 2,527 | 1.26 | 1.015 | -2 |
| CAPEX | 8,062 | 0.049 | 0.027 | 5,535 | 0.048 | 0.025 | 2,527 | 0.05 | 0.029 | 1.122 |
| Tangible Assets | 8,062 | 0.26 | 0.157 | 5,535 | 0.261 | 0.15 | 2,527 | 0.259 | 0.179 | -0.32 |
| Size | 8,062 | 4.636 | 4.567 | 5,535 | 4.649 | 4.566 | 2,527 | 4.608 | 4.571 | -2.051 |
| Short-to-total Debt | 8,062 | 0.466 | 0.396 | 5,535 | 0.457 | 0.379 | 2,527 | 0.483 | 0.424 | 2.998 |
| Age | 8.062 | 2.238 | 2.303 | 5,535 | 2.234 | 2.197 | 2,527 | 2.248 | 2.303 | 0.627 |

| PANEL B | Serial issuers | | | | | Single issuers | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Min | Max | St.Dev. | 5% | 95% | Min | Max | St.Dev. | 5% | 95% |
| Leverage (market) | 0 | 0.841 | 0.225 | 0 | 0.706 | 0 | 0.841 | 0.214 | 0 | 0.672 |
| ROA | -3.576 | 0.506 | 0.375 | -0.753 | 0.195 | -3.576 | 0.506 | 0.344 | -0.518 | 0.233 |
| Growth | 0 | 13.695 | 1.577 | 0.435 | 2.973 | 0 | 13.7 | 1.437 | 0.517 | 2.242 |
| CAPEX | 0 | 0.445 | 0.069 | 0 | 0.187 | 0 | 0.445 | 0.066 | 0.001 | 0.177 |
| Tangible Assets | 0 | 0.946 | 0.279 | 0.003 | 0.871 | 0 | 0.946 | 0.249 | 0.006 | 0.798 |
| Size | 1.869 | 6.957 | 0.978 | 3.155 | 6.48 | 1.869 | 6.957 | 0.781 | 3.433 | 5.993 |
| Short-to-total Debt | 0 | 1 | 0.364 | 0 | 1 | 0 | 1 | 0.356 | 0.001 | 1 |
| Age | 0 | 3.85 | 0.999 | 0.693 | 3.714 | 0 | 3.85 | 0.981 | 0.693 | 3.638 |

Note: Table 2 reports descriptive statistics for the entire sample, as well as serial issuer and single issuer subsamples, of UK firms issuing equity

during 1995–2015. Serial SEOs is a dummy variable taking the value of 1 when the firm issued more than one SEO during the sample period and 0 otherwise. ROA is equal to the ratio of $EBIT_t$ to ((Total $Assets_t$ + Total $Assets_{t-1}$)/2) and is not in percentage terms. Growth here is defined as the ratio of Total Assets Turnover at time *t* over the Total Assets Turnover a time *t*-1. Capital Expenditures (CAPEX) are standardised using Total Assets. Tangible assets variable here is defined as property, plant and equipment over total assets. Size is the natural logarithm of Total Assets and Age the natural logarithm of age in years. Note that the variables refer to the lagged values of the reported variables, since the lagged data are used later in our analysis. All variables are winsorised at 1% on both tails.

**Table 3**
Correlation matrix.

| | Growth | Tangible Assets | Age (log) | Short-to-total debt | CAPEX | ROA | Size | Multiple SEOs |
|---|---|---|---|---|---|---|---|---|
| Growth | 1 | | | | | | | |
| Tangible Assets | -0.036 | 1 | | | | | | |
| Age | -0.179 | 0.089 | 1 | | | | | |
| Short/Total debt | 0.043 | -0.237 | -0.085 | 1 | | | | |
| CAPEX | 0.028 | 0.484 | -0.111 | -0.094 | 1 | | | |
| ROA | -0.298 | 0.126 | 0.209 | -0.130 | -0.009 | 1 | | |
| Size | -0.168 | 0.201 | 0.395 | -0.369 | 0.005 | 0.427 | 1 | |
| Multiple SEOs | 0.022 | 0.003 | -0.007 | -0.033 | -0.012 | -0.085 | 0.021 | 1 |

Note: This table reports correlations among the different variables included in our study. The variables in this table will be the independent variables of the regression presented in Table 4.

**Table 4**

Determinants of leverage.

| | (1)<br>Full sample | (2)<br>MM | (3)<br>AIM | (4)<br>Full sample | (5)<br>MM | (6)<br>AIM |
|---|---|---|---|---|---|---|
| Serial SEOs (dummy) | 0.029*** | 0.026** | 0.028** | 0.030*** | 0.029** | 0.028** |
| | (3.126) | (1.999) | (2.211) | (3.250) | (2.276) | (2.215) |
| ROA | -0.018 | -0.069** | -0.005 | | | |
| | (-1.188) | (-2.233) | (-0.389) | | | |
| Growth | -0.001 | -0.001 | 0.001 | -0.000 | 0.001 | 0.001 |
| | (-0.495) | (-0.287) | (0.314) | (-0.128) | (0.310) | (0.389) |
| CAPEX | -0.254*** | -0.300*** | -0.147** | -0.249*** | -0.311*** | -0.145** |
| | (-4.622) | (-3.713) | (-2.270) | (-4.576) | (-3.769) | (-2.275) |
| Tangible Assets | 0.181*** | 0.202*** | 0.145*** | 0.180*** | 0.198*** | 0.145*** |
| | (7.014) | (4.910) | (4.792) | (6.902) | (4.617) | (4.796) |
| Size | 0.024*** | 0.021** | 0.035*** | 0.021*** | 0.0134 | 0.033*** |
| | (3.249) | (1.989) | (3.229) | (2.753) | (1.273) | (3.174) |
| Short-to-total Debt | -0.076*** | -0.088*** | -0.062*** | -0.076*** | -0.090*** | -0.062*** |
| | (-6.080) | (-5.115) | (-3.838) | (-6.064) | (-5.132) | (-3.838) |
| Age | 0.021*** | 0.008 | 0.039*** | 0.021*** | 0.009 | 0.039*** |
| | (4.288) | (0.968) | (6.830) | (4.295) | (1.092) | (6.801) |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 8,062 | 4,483 | 3,579 | 8,062 | 4,483 | 3,579 |
| Adj. $R^2$ | 0.226 | 0.301 | 0.173 | 0.226 | 0.297 | 0.173 |

Note: This table reports results from pooled OLS regressions for the entire sample as well as the Main Market (MM) and AIM subsamples of UK firms conducting SEOs during the 1995–2015 period. The dependent variable is market Leverage, defined as the ratio of book value of Debt over the market value of Total Assets. Serial SEOs is a dummy variable taking the value of 1 when the firm issues equity more than once during the period examined and 0 otherwise. ROA is equal to the ratio of $EBIT_t$ over ((Total $Assets_t$ + Total $Assets_{t-1}$)/2). Growth here is defined as the ratio of Total Assets Turnover at time t over the Total Assets Turnover a time t-1. Capital Expenditures are standardised using Total Assets. Size is the natural logarithm of Total Assets and Age the natural logarithm of age in years. The independent variables are lagged one period to take into account potential endogeneity issues. *, ** and *** denote statistical significance of the results at 10%, 5% and 1% level respectively. Year dummies, two-digit SIC code industry dummies as well as a constant, are included in the regression (results not reported here). Standard errors are corrected for heteroscedasticity as well as firm and year clustering. t-statistics are reported in the parentheses.

**Table 5**
Cash flow sensitivity of debt and cash holdings for serial and single SEOs.

| | Full sample | | Serial SEOs | | Single SEOs | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | Cash flow sensitivity of debt | Cash flow sensitivity of cash holdings | Cash flow sensitivity of debt | Cash flow sensitivity of cash holdings | Cash flow sensitivity of debt | Cash flow sensitivity of cash holdings |
| $Debt_{i,t-1}$ | -0.180*** | | -0.182*** | | -0.212*** | |
| | (-20.57) | | (-17.00) | | (-13.28) | |
| $CashHold_{i,t-1}$ | | -0.367*** | | -0.355*** | | -0.422*** |
| | | (-31.40) | | (-24.54) | | (-20.67) |
| $\Delta Debt_{i,t}$ | | -0.193*** | | -0.213*** | | -0.036 |
| | | (-3.459) | | (-3.149) | | (-0.418) |
| $\Delta CashHold_{i,t}$ | 0.047* | | 0.053 | | 0.026 | |
| | (1.691) | | (1.478) | | (0.616) | |
| $Cashflow_{i,t}$ | 0.016** | 0.159*** | 0.015* | 0.154*** | 0.017 | 0.193*** |
| | (2.243) | (23.99) | (1.782) | (19.84) | (1.146) | (14.39) |
| $Q_{i,t}$ | -0.001 | 0.001 | -0.001 | 0.002** | -0.003** | -0.003* |
| | (-1.424) | (1.199) | (-0.685) | (2.249) | (-2.148) | (-1.733) |
| $Size_{i,t}$ | 0.001 | -0.012*** | 0.001 | -0.011*** | -0.001 | -0.013*** |
| | (1.100) | (-11.24) | (1.118) | (-8.581) | (-0.492) | (-6.161) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.104 | 0.211 | 0.109 | 0.190 | 0.161 | 0.335 |
| N | 7,318 | 7,318 | 5,073 | 5,073 | 2,245 | 2,245 |

Note: This table reports results from the 3SLS regressions with year and industry as fixed effects (Equations 4.2 and 4.3) for debt issuance and cash holdings, following the approach of Acharya et al. (2007). The results are reported for the entire sample of UK firms' SEOs 1995–2015 (Columns 1 and 2) as well as the subsamples of Serial SEOs (columns 3 and 4) and single issuers (columns 5 and 6). Firms are serial SEO issuers if they have conducted SEOs more than once during our sample period.

**Table 6**

Cash flow sensitivity of debt and cash holdings for serial and single SEOs on London MM and AIM.

| | MIM | | | | AIM | | | |
|---|---|---|---|---|---|---|---|---|
| | Serial SEOs | | Single SEOs | | Serial SEOs | | Single SEOs | |
| | (1) Cash flow sensitivity of debt | (2) Cash flow sensitivity of cash holdings | (3) Cash flow sensitivity of debt | (4) Cash flow sensitivity of cash holdings | (5) Cash flow sensitivity of debt | (6) Cash flow sensitivity of cash holdings | (7) Cash flow sensitivity of debt | (8) Cash flow sensitivity of cash holdings |
| $Debt_{i,t-1}$ | -0.179*** | | -0.210*** | | -0.245*** | | -0.228*** | |
| | (-11.41) | | (-11.44) | | (-15.64) | | (-7.977) | |
| $CashHold_{i,t-1}$ | | -0.311*** | | -0.338*** | | -0.436*** | | -0.530*** |
| | | (-16.71) | | (-14.14) | | (-19.42) | | (-14.30) |
| $\Delta Debt_{i,t}$ | | -0.200** | | 0.017 | | -0.213*** | | -0.163 |
| | | (-2.267) | | (0.202) | | (-2.676) | | (-0.974) |
| $\Delta CashHold_{i,t}$ | 0.136** | | 0.024 | | 0.017 | | 0.014 | |
| | (2.208) | | (0.326) | | (0.422) | | (0.259) | |
| $Cashflow_{i,t}$ | 0.029* | 0.170*** | 0.138*** | 0.301*** | 0.016 | 0.152*** | -0.002 | 0.153*** |
| | (1.702) | (12.17) | (4.243) | (11.91) | (1.511) | (15.07) | (-0.105) | (7.430) |
| $Q_{i,t}$ | 0.002 | 0.010*** | -0.006*** | 0.006** | -0.001 | -0.001 | -0.002 | -0.006*** |
| | (1.509) | (7.053) | (-2.760) | (2.395) | (-1.256) | (-0.710) | (-1.274) | (-2.664) |
| $Size_{i,t}$ | 0.000 | -0.005*** | -0.003 | -0.011*** | -0.005** | -0.016*** | 0.000 | -0.021*** |
| | (0.174) | (-2.988) | (-1.290) | (-5.160) | (-2.288) | (-6.376) | (0.017) | (-4.404) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.128 | 0.134 | 0.253 | 0.300 | 0.153 | 0.255 | 0.191 | 0.397 |
| N | 2,585 | 2,585 | 1,463 | 1,463 | 2,488 | 2,488 | 782 | 782 |

Note: This table reports results from 3SLS (with year and industry fixed effects) models for debt issuance and cash holdings following the approach of Acharya et al. (2007). Our sample consists of UK firms conducting SEOs during the period 1995-2015. Results are reported for serial and single issuers listed on London's Main Market (MM) in columns 1 & 2 and 3 & 4 respectively. Similar results for firms listed on AIM are reported in columns 5 to 8.

**Table 7**

Cash flow sensitivity of debt and cash holdings for serial and single issuers: financial constraint proxied by firm size.

| PANEL A: Cash flow sensitivity of debt | | | | | | |
|---|---|---|---|---|---|---|
| | Full sample | | Serial SEO firms | | Single SEO firms | |
| | Constrained | Unconstrained | Constrained | Unconstrained | Constrained | Unconstrained |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $Debt_{i,t-1}$ | -0.218*** | -0.225*** | -0.213*** | -0.207*** | -0.233*** | -0.316*** |
| | (-13.58) | (-12.43) | (-11.26) | (-9.209) | (-7.299) | (-9.014) |
| $\Delta CashHold_{i,t}$ | 0.002 | 0.442*** | -0.001 | 0.535** | 0.0101 | -0.292 |
| | -0.07 | -2.666 | (-0.020) | -2.491 | -0.209 | (-1.472) |
| $Cashflow_{i,t}$ | 0.024** | -0.056 | 0.028** | -0.093 | 0.004 | -0.001 |
| | -2.496 | (-0.923) | -2.408 | (-1.203) | -0.221 | (-0.008) |
| $Q_{i,t}$ | -0.001 | -0.008 | 0 | -0.002 | -0.003* | -0.009 |
| | (-0.797) | (-1.585) | -0.022 | (-0.295) | (-1.940) | (-0.658) |
| $Size_{i,t}$ | -0.014*** | -0.012*** | -0.013*** | -0.014*** | -0.018*** | -0.021*** |
| | (-5.333) | (-4.299) | (-3.886) | (-3.755) | (-3.610) | (-3.367) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.163 | 0.139 | 0.176 | 0.131 | 0.262 | 0.261 |
| N | 2,233 | 2,090 | 1,611 | 1,559 | 622 | 531 |
| PANEL B: Cash flow sensitivity of cash holdings | | | | | | |
| | Full sample | | Serial SEO firms | | Single SEO firms | |
| | Constrained | Unconstrained | Constrained | Unconstrained | Constrained | Unconstrained |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $CashHold_{i,t-1}$ | -0.538*** | -0.176*** | -0.510*** | -0.157*** | -0.613*** | -0.353*** |
| | (-21.94) | (-10.08) | (-17.06) | (-7.587) | (-14.62) | (-8.012) |
| $\Delta Debt_{i,t}$ | -0.397*** | 0.039 | -0.396*** | 0.072 | -0.052 | -0.07 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (-3.996) | -0.844 | (-3.339) | -1.181 | (-0.270) | (-1.090) |
| $Cashflow_{i,t}$ | 0.170*** | 0.180*** | 0.169*** | 0.188*** | 0.165*** | 0.250*** |
| | -15.54 | -5.983 | -13.25 | -5.175 | -7.494 | -3.9 |
| $Q_{i,t}$ | 0 | 0.015*** | 0.001 | 0.010*** | -0.004* | 0.038*** |
| | (-0.359) | -4.746 | -0.42 | -2.915 | (-1.740) | -4.636 |
| $Size_{i,t}$ | -0.029*** | -0.007*** | -0.027*** | -0.006** | -0.032*** | -0.005 |
| | (-7.268) | (-3.623) | (-5.698) | (-2.371) | (-4.089) | (-1.332) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.292 | 0.115 | 0.27 | 0.115 | 0.475 | 0.227 |
| N | 2,233 | 2,090 | 1,611 | 1,559 | 622 | 531 |

Note: This table reports results estimated from the 3SLS regressions with year and industry fixed effects (equations 2 and 3) for debt issuance and cash holdings, following the approach of Acharya et al. (2007). (Un)constrained firms proxies are using the asset size of the issuing firm (per year). The results are reported for constrained and unconstrained firms for the entire sample of UK firms issuing equity during 1995–2015 (Columns 1 and 2) as well as the subsamples of serial issuers (columns 3 and 4) and single issuers (columns 5 and 6). Firms are considered serial issuers if they have conducted SEOs more than once during our sample period. Panel A contains the results for cash flow sensitivity of debt while Panel B the results for cash flow sensitivity of cash holdings.

**Table 8**

Cash flow sensitivity of debt and cash holdings for serial and single issuers: financial constraint proxied by dividend payout ratio.

| PANEL A: Cash flow sensitivity of debt | | | | | | |
|---|---|---|---|---|---|---|
| | Full sample | | Serial SEO firms | | Single SEO firms | |
| | Constrained | Unconstrained | Constrained | Unconstrained | Constrained | Unconstrained |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $Debt_{i,t-1}$ | -0.229*** | -0.126*** | -0.231*** | -0.111*** | -0.257*** | -0.202*** |
| | (-18.04) | (-7.600) | (-15.81) | (-5.005) | (-9.016) | (-7.387) |
| $\Delta CashHold_{i,t}$ | 0.009 | 0.141 | 0.007 | 0.246 | 0.016 | 0.201 |
| | (0.281) | (0.844) | (0.169) | (1.133) | (0.317) | (1.099) |
| $Cashflow_{i,t}$ | 0.021** | -0.011 | 0.021** | 0.003 | 0.008 | -0.025 |
| | (2.346) | (-0.184) | (2.089) | (0.0292) | (0.382) | (-0.302) |
| $Q_{i,t}$ | -0.001 | 0.003 | -0.000 | -0.003 | -0.004** | 0.009* |
| | (-1.211) | (0.714) | (-0.125) | (-0.591) | (-2.543) | (1.933) |
| $Size_{i,t}$ | -0.005*** | 0.001 | -0.004** | -0.001 | -0.009** | -0.001 |
| | (-2.867) | (0.271) | (-2.281) | (-0.199) | (-2.430) | (-0.211) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.144 | 0.168 | 0.154 | 0.166 | 0.204 | 0.232 |
| N | 3,601 | 1,881 | 2,737 | 1,202 | 864 | 679 |
| PANEL B: Cash flow sensitivity of cash holdings | | | | | | |
| | Full sample | | Serial SEO firms | | Single SEO firms | |
| | Constrained | Unconstrained | Constrained | Unconstrained | Constrained | Unconstrained |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $CashHold_{i,t-1}$ | -0.455*** | -0.124*** | -0.427*** | -0.119*** | -0.551*** | -0.214*** |
| | (-24.96) | (-8.475) | (-19.96) | (-6.578) | (-15.92) | (-7.754) |

| | | | | | | |
|---|---|---|---|---|---|---|
| $\Delta Debt_{i,t}$ | -0.262*** | 0.096 | -0.253*** | 0.108 | -0.0985 | 0.056 |
| | (-3.755) | (1.031) | (-3.163) | (0.801) | (-0.719) | (0.584) |
| $Cashflow_{i,t}$ | 0.164*** | 0.154*** | 0.157*** | 0.249*** | 0.184*** | 0.135** |
| | (17.93) | (4.003) | (15.20) | (4.626) | (9.080) | (2.360) |
| $Q_{i,t}$ | 0.001 | -0.001 | 0.001 | -0.004 | -0.004* | 0.009** |
| | (0.538) | (-0.282) | (1.262) | (-0.985) | (-1.649) | (2.342) |
| $Size_{i,t}$ | -0.017*** | 0.002 | -0.017*** | 0.004*** | -0.025*** | -0.003 |
| | (-8.580) | (1.504) | (-7.070) | (2.854) | (-5.253) | (-1.354) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.253 | 0.095 | 0.231 | 0.138 | 0.418 | 0.183 |
| N | 3,601 | 1,881 | 2,737 | 1,202 | 864 | 679 |

Note: This table reports results of 3SLS regressions with year and industry fixed effects (equations 2 and 3) for debt issuance and cash holdings, following the approach of Acharya et al. (2007). (Un)constrained firms are proxied by the dividend payout ratio (dividends per share / earnings per share) of the issuing firm (per year). Results are reported for constrained and unconstrained firms for the entire sample of UK firms issuing equity during 1995-2015 (Columns 1 and 2) as well as the subsamples of serial issuers (columns 3 and 4) and single issuers (columns 5 and 6). Firms are considered serial SEO issuers if they conducted SEOs more than once in the sample period. Panel A is for cash flow sensitivity of debt and Panel B for cash flow sensitivity of cash holdings.

**Table 9**

Cash flow sensitivity of debt and cash holdings for serial and single issuers: financial constraint proxied by SA index.

| PANEL A: Cash flow sensitivity of debt | | | | | | |
|---|---|---|---|---|---|---|
| | Full sample | | Serial SEO firms | | Single SEO firms | |
| | Constrained | Unconstrained | Constrained | Unconstrained | Constrained | Unconstrained |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $Debt_{i,t-1}$ | -0.231*** | -0.178*** | -0.234*** | -0.179*** | -0.244*** | -0.209*** |
| | (-18.18) | (-14.21) | (-15.56) | (-11.01) | (-9.885) | (-9.808) |
| $\Delta CashHold_{i,t}$ | 0.030 | 0.184** | 0.028 | 0.201** | 0.030 | 0.067 |
| | (1.000) | (2.371) | (0.738) | (2.111) | (0.667) | (0.597) |
| $Cashflow_{i,t}$ | 0.019** | 0.054** | 0.018* | 0.056** | 0.014 | 0.045 |
| | (2.359) | (2.288) | (1.893) | (1.968) | (0.893) | (0.846) |
| $Q_{i,t}$ | -0.001* | 0.002 | -0.001 | 0.002 | -0.003** | 0.001 |
| | (-1.689) | (0.769) | (-0.615) | (0.980) | (-2.369) | (0.264) |
| $Size_{i,t}$ | -0.006*** | -0.003* | -0.007*** | -0.003 | -0.004 | -0.006** |
| | (-3.846) | (-1.679) | (-3.329) | (-1.292) | (-1.293) | (-2.020) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.154 | 0.099 | 0.169 | 0.101 | 0.210 | 0.160 |
| N | 3,714 | 3,604 | 2,599 | 2,474 | 1,115 | 1,130 |
| PANEL B: Cash flow sensitivity of cash holdings | | | | | | |
| | Full sample | | Serial SEO firms | | Single SEO firms | |
| | Constrained | Unconstrained | Constrained | Unconstrained | Constrained | Unconstrained |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $CashHold_{i,t-1}$ | -0.445*** | -0.230*** | -0.428*** | -0.232*** | -0.507*** | -0.313*** |
| | (-25.19) | (-16.69) | (-19.77) | (-13.83) | (-16.83) | (-11.63) |

| | | | | | | |
|---|---|---|---|---|---|---|
| $\Delta Debt_{i,t}$ | -0.278*** | 0.048 | -0.254*** | -0.011 | -0.086 | 0.050 |
| | (-3.791) | (0.889) | (-2.985) | (-0.165) | (-0.635) | (0.641) |
| $Cashflow_{i,t}$ | 0.166*** | 0.126*** | 0.159*** | 0.136*** | 0.192*** | 0.133*** |
| | (18.79) | (7.516) | (15.59) | (6.949) | (10.81) | (3.350) |
| $Q_{i,t}$ | 0.000 | 0.007*** | 0.001 | 0.005*** | -0.005** | 0.017*** |
| | (-0.025) | (4.109) | (1.009) | (2.884) | (-2.466) | (4.718) |
| $Size_{i,t}$ | -0.021*** | -0.004*** | -0.019*** | -0.004*** | -0.028*** | -0.001 |
| | (-9.248) | (-3.112) | (-7.077) | (-2.660) | (-6.433) | (-0.269) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.249 | 0.134 | 0.237 | 0.152 | 0.397 | 0.191 |
| N | 3,714 | 3,604 | 2,599 | 2,474 | 1,115 | 1,130 |

Note: This table reports results of 3SLS regressions with year and industry fixed effects (equations 2 and 3) for debt issuance and cash holdings, following the approach of Acharya et al. (2007). (Un)constrained firms are proxied by the SA (size-age) index developed by Hadlock and Pierce (2010). Firms with above median SA index score are defined as constrained and those below median as unconstrained. The results are reported for constrained and unconstrained firms for the entire sample of UK firms issuing equity during 1995–2015 (Columns 1 and 2) as well as the subsamples of serial issuers (columns 3 and 4) and single issuers (columns 5 and 6). Firms are considered serial SEO issuers if they conducted SEOs more than once in the sample period. Panel A is for cash flow sensitivity of debt and Panel B for cash flow sensitivity of cash holdings.

**Table 10**

Determinants of leverage: alternative serial SEO dummy definition.

| | (1) Full sample | (2) MM | (3) AIM | (4) Full sample | (5) MM | (6) AIM |
|---|---|---|---|---|---|---|
| Serial SEOs (dummy) | 0.019* | 0.022* | 0.017 | 0.020** | 0.025* | 0.017 |
| | (1.941) | (1.714) | (1.351) | (2.024) | (1.943) | (1.364) |
| ROA | -0.011 | -0.048 | -0.008 | | | |
| | (-0.758) | (-1.623) | (-0.562) | | | |
| Growth | 0.003 | -0.000 | 0.006 | 0.004 | 0.003 | 0.007 |
| | (0.733) | (-0.010) | (1.370) | (0.925) | (0.413) | (1.485) |
| CAPEX | -0.328*** | -0.370*** | -0.230** | -0.327*** | -0.379*** | -0.227** |
| | (-4.636) | (-3.579) | (-2.547) | (-4.620) | (-3.630) | (-2.526) |
| Tangible Assets | 0.203*** | 0.229*** | 0.167*** | 0.203*** | 0.229*** | 0.167*** |
| | (7.174) | (5.577) | (4.619) | (7.179) | (5.571) | (4.639) |
| Size | 0.029*** | 0.019* | 0.046*** | 0.027*** | 0.015 | 0.044*** |
| | (3.723) | (1.754) | (4.455) | (3.457) | (1.426) | (4.774) |
| Short-to-total Debt | -0.068*** | -0.087*** | -0.050*** | -0.068*** | -0.088*** | -0.049*** |
| | (-5.544) | (-5.097) | (-3.401) | (-5.566) | (-5.130) | (-3.398) |
| Age | 0.011* | 0.002 | 0.026*** | 0.011* | 0.002 | 0.025*** |
| | (1.796) | (0.223) | (2.894) | (1.795) | (0.282) | (2.851) |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 5,969 | 3,462 | 2,507 | 5,969 | 3,462 | 2,507 |
| Adj. $R^2$ | 0.226 | 0.276 | 0.189 | 0.226 | 0.275 | 0.189 |

Note: This table reports results from pooled OLS regressions for the entire sample as well as the Main Market (MM) and AIM subsamples of UK firms conducting SEOs 1995–2015. The dependent variable is market Leverage, defined as the ratio of book value of Debt over the market value of Total Assets. Serial SEOs is a dummy variable taking the value of 1 if the company conducted more than one SEO after the current year (not over the whole sample period 1995–2015) and 0 otherwise. ROA is equal the ratio of EBITt over ((Total Assetst + Total Assetst-1)/2). Growth is defined as the ratio of Total Assets Turnover at time t over the Total Assets Turnover a time t-1. Capital Expenditures are standardised using Total Assets. Size is the natural logarithm of Total Assets and Age the natural logarithm of age in years. Year dummies, two-digit SIC

code industry dummies as well as a constant are included in the regression (results not reported here). Standard errors are corrected for heteroscedasticity and firm and year clustering. t-statistics are reported in the parentheses. All variables are winsorised at 2.5% on both tails. Independent variables are lagged one period in order to take into account potential endogeneity issues. *, ** and *** denote statistical significance of the results at 10%, 5% and 1% level respectively.

**Table 11**

Cash flow sensitivity of debt and cash holdings for serial and single issuers: alternative serial SEO dummy definition.

| | Full sample | | Serial SEOs | | Single SEOs | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | Cash flow sensitivity of debt | Cash flow sensitivity of cash holdings | Cash flow sensitivity of debt | Cash flow sensitivity of cash holdings | Cash flow sensitivity of debt | Cash flow sensitivity of cash holdings |
| $Debt_{i,t-1}$ | -0.157*** | | -0.162*** | | -0.184*** | |
| | (-17.10) | | (-12.96) | | (-13.15) | |
| $CashHold_{i,t-1}$ | | -0.307*** | | -0.289*** | | -0.346*** |
| | | (-25.17) | | (-17.30) | | (-18.83) |
| $\Delta Debt_{i,t}$ | | -0.106 | | -0.111 | | -0.075 |
| | | (-1.522) | | (-1.197) | | (-0.842) |
| $\Delta CashHold_{i,t}$ | 0.093*** | | 0.126** | | 0.038 | |
| | (2.718) | | (2.557) | | (0.829) | |
| $Cashflow_{i,t}$ | 0.009 | 0.180*** | 0.002 | 0.163*** | 0.027 | 0.237*** |
| | (0.891) | (19.40) | (0.173) | (13.47) | (1.608) | (15.97) |
| $Q_{i,t}$ | 0.001 | 0.004*** | 0.002 | 0.005** | -0.000 | 0.003 |
| | (1.100) | (2.714) | (1.209) | (2.482) | (-0.343) | (1.460) |
| $Size_{i,t}$ | 0.002** | -0.010*** | 0.003** | -0.010*** | 0.000 | -0.013*** |
| | (2.234) | (-9.853) | (2.100) | (-6.781) | (0.045) | (-5.956) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.099 | 0.213 | 0.111 | 0.191 | 0.152 | 0.308 |
| N | 5,286 | 5,286 | 3,041 | 3,041 | 2,245 | 2,245 |

Note: This table reports results estimated from the 3SLS regressions with year and industry fixed effects (equations 2 and 3) for debt issuance and cash holdings, following the approach of Acharya et al. (2007). The results are reported for the entire sample of UK firms issuing equity during 1995–2015 (Columns 1 and 2) as well as the subsamples of serial issuers (columns 3 and 4) and single issuers (columns 5 and 6). Serial SEO issuers is a dummy variable taking the value of 1 if the company conducted more than one equity issue after the current time and not the whole time period 1995–2015, and the value of 0 otherwise.

**Table 12**

Cash flow sensitivity of debt and cash holdings for serial and single issuers on London MM and AIM: alternative serial SEO dummy definition.

| | MIM | | | | AIM | | | |
|---|---|---|---|---|---|---|---|---|
| | Serial SEOs | | Single SEOs | | Serial SEOs | | Single SEOs | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| | Cash flow sensitivity of debt | Cash flow sensitivity of cash holdings | Cash flow sensitivity of debt | Cash flow sensitivity of cash holdings | Cash flow sensitivity of debt | Cash flow sensitivity of cash holdings | Cash flow sensitivity of debt | Cash flow sensitivity of cash holdings |
| $Debt_{i,t-1}$ | -0.148*** | | -0.193*** | | -0.248*** | | -0.201*** | |
| | (-7.904) | | (-11.14) | | (-13.37) | | (-8.290) | |
| $CashHold_{i,t-1}$ | | -0.262*** | | -0.321*** | | -0.339*** | | -0.405*** |
| | | (-11.89) | | (-13.67) | | (-13.14) | | (-12.60) |
| $\Delta Debt_{i,t}$ | | -0.101 | | 0.003 | | -0.121 | | -0.264 |
| | | (-0.803) | | (0.028) | | (-1.176) | | (-1.556) |
| $\Delta CashHold_{i,t}$ | 0.200** | | 0.067 | | 0.053 | | 0.032 | |
| | (2.283) | | (0.917) | | (0.951) | | (0.558) | |
| $Cashflow_{i,t}$ | -0.010 | 0.154*** | 0.091*** | 0.282*** | 0.019 | 0.163*** | 0.014 | 0.196*** |
| | (-0.380) | (7.763) | (3.034) | (11.60) | (1.228) | (9.811) | (0.665) | (8.095) |
| $Q_{i,t}$ | -0.002 | 0.005** | -0.003 | 0.008*** | 0.005** | 0.002 | 0.002 | -0.003 |
| | (-0.909) | (1.982) | (-0.918) | (2.629) | (2.381) | (0.804) | (0.591) | (-0.700) |
| $Size_{i,t}$ | 0.001 | -0.004* | 0.001 | -0.004* | 0.0051 | -0.016*** | 0.004 | -0.015*** |
| | (0.392) | (-1.923) | (0.392) | (-1.923) | (0.192) | (-5.188) | (1.202) | (-3.690) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.144 | 0.167 | 0.210 | 0.272 | 0.168 | 0.250 | 0.184 | 0.355 |
| N | 1,598 | 1,598 | 1,463 | 1,463 | 1,443 | 1,443 | 782 | 782 |

Note: This table reports results from 3SLS (with year and industry fixed effects) models for debt issuance and cash holdings, following the approach of Acharya et al. (2007). Our sample consists of UK firms issuing equity during the period 1995–2015. Serial SEOs is a dummy variable taking the value of 1 if the company conducted more than one equity issue after the current year and not the whole time period 1995–2015, and the value of 0 otherwise. Results are reported for serial and single SEOs listed in the London primary Main Market (MM) in columns 1 & 2 and 3 & 4, respectively. Similar results for firms listed on AIM are reported in columns 5 to 8.

**Appendix A**

Variable definitions.

| **Variable** | **Definitions** |
|---|---|
| Leverage | Book value of debt over market value of assets |
| Serial SEO (dummy) | Dummy variable taking the value of 1 when the firm conducts more than one SEO during the sample period and 0 otherwise |
| ROA | Ratio of $EBIT_t$ over ((Total $Assets_t$ + Total $Assets_{t-1}$)/2) |
| Growth | Ratio of Total Assets Turnover at time $_t$ over the Total Assets Turnover a time $_{t-1}$ |
| CAPEX | Capital expenditures standardised using total assets |
| Tangible Assets | Property, plant and equipment over total assets |
| Size | Total assets in natural logarithm |
| Short-to-total Debt | Ratio of short-term debt over total debt |
| Age | Age in years, in natural logarithm |
| ΔDebt | Ratio of the changes in long-term debt over total book value of assets |
| ΔCash Hold | Ratio of changes in cash and cash equivalents over total book value of assets |
| Cash Flow | Proxy for free cash flow. Calculated as: [(Operating income - depreciation & amortisation – income tax – payment to debt holders– payment to equity holders) / total assets] |
| Q | Proxy for investment opportunities. It is the ratio of the market value of assets over book value of assets. |
| Sales size | The natural log of sales |
| Debt | Ratio of total long-term debt over total assets |
| Cash Flow | Ratio of cash and short-term investments over total assets |

**Appendix B**

**Table B1**

Cash flow sensitivity of debt and cash holdings for serial and single issuers: financial constraint proxied by firm size (alternative serial SEO dummy definition).

| PANEL A: Cash flow sensitivity of debt | | | | | | |
|---|---|---|---|---|---|---|
| | Full sample | | Serial SEO firms | | Single SEO firms | |
| | Constrained | Unconstrained | Constrained | Unconstrained | Constrained | Unconstrained |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $Debt_{i,t-1}$ | -0.199*** | -0.191*** | -0.203*** | -0.182*** | -0.213*** | -0.271*** |
| | (-12.26) | (-9.531) | (-8.859) | (-6.591) | (-8.643) | (-8.521) |
| $\Delta CashHold_{i,t}$ | 0.002 | 0.230 | 0.024 | 0.349** | 0.025 | -0.258* |
| | (0.505) | (1.638) | (0.403) | (2.000) | (0.511) | (-1.673) |
| $Cashflow_{i,t}$ | 0.011 | 0.014 | 0.006 | -0.012 | 0.013 | 0.051 |
| | (0.921) | (0.242) | (0.341) | (-0.148) | (0.697) | (0.500) |
| $Q_{i,t}$ | 0.003 | -0.008 | 0.005** | 0.003 | 0.001 | -0.018 |
| | (1.831) | (-1.400) | (2.312) | (0.385) | (0.449) | (-1.630) |
| $Size_{i,t}$ | -0.007*** | -0.016*** | -0.005 | -0.014*** | -0.007** | -0.028*** |
| | (-2.827) | (-5.562) | (-1.380) | (-3.671) | (-1.966) | (-4.946) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.163 | 0.201 | 0.188 | 0.207 | 0.225 | 0.302 |
| N | 1,625 | 1,499 | 867 | 1,010 | 758 | 489 |
| PANEL B: Cash flow sensitivity of cash holdings | | | | | | |
| | Full sample | | Serial SEO firms | | Single SEO firms | |
| | Constrained | Unconstrained | Constrained | Unconstrained | Constrained | Unconstrained |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $CashHold_{i,t-1}$ | -0.401*** | -0.244*** | -0.368*** | -0.243*** | -0.433*** | -0.410*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (-16.50) | (-10.84) | (-10.41) | (-8.566) | (-13.31) | (-8.927) |
| $\Delta Debt_{i,t}$ | -0.334*** | 0.062 | -0.316* | 0.144 | -0.210 | -0.056 |
| | (-2.629) | (0.921) | (-1.777) | (1.576) | (-1.198) | (-0.709) |
| $Cashflow_{i,t}$ | 0.194*** | 0.121*** | 0.181*** | 0.143*** | 0.212*** | 0.218*** |
| | (12.90) | (3.280) | (8.930) | (3.006) | (9.186) | (3.234) |
| $Q_{i,t}$ | 0.005* | 0.010** | 0.005 | 0.004 | 0.002 | 0.015* |
| | (1.943) | (2.427) | (1.438) | (0.767) | (0.472) | (1.732) |
| $Size_{i,t}$ | -0.021*** | -0.006** | -0.024*** | -0.002 | -0.020*** | -0.004 |
| | (-5.452) | (-2.537) | (-4.272) | (-0.798) | (-3.813) | (-0.986) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.294 | 0.141 | 0.283 | 0.133 | 0.420 | 0.267 |
| N | 1,625 | 1,499 | 867 | 1,010 | 6758 | 489 |

Note: This table reports results estimated from the 3SLS regressions with year and industry fixed effects (equations 2 and 3) for debt issuance and cash holdings, following the approach of Acharya et al. (2007). (Un)constrained firms are proxied by the asset size of the issuing firm (per year). Results are reported for constrained and unconstrained firms for the entire sample of UK firms issuing equity during 1995–2015 (Columns 1 and 2) as well as the subsamples of serial issuers (columns 3 and 4) and single issuers (columns 5 and 6). Firms in our sample are considered serial SEO issuers if they have issued equity more than once during our sample period. Panel A contains the results for cash flow sensitivity of debt while Panel B contains the results for cash flow sensitivity of cash holdings.

**Table B2**

Cash flow sensitivity of debt and cash holdings for serial and single issuers: financial constraint proxied by dividend payout ratio (alternative serial SEO dummy definition).

| PANEL A: Cash flow sensitivity of debt | | | | | | |
|---|---|---|---|---|---|---|
| | Full sample | | Serial SEO firms | | Single SEO firms | |
| | Constrained | Unconstrained | Constrained | Unconstrained | Constrained | Unconstrained |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $Debt_{i,t-1}$ | -0.213*** | -0.115*** | -0.228*** | -0.117*** | -0.214*** | -0.185*** |
| | (-16.34) | (-5.804) | (-13.71) | (-3.628) | (-9.280) | (-6.761) |
| $\Delta CashHold_{i,t}$ | 0.039 | 0.110 | 0.071 | -0.021 | 0.016 | 0.285* |
| | (1.065) | (0.791) | (1.383) | (-0.100) | (0.299) | (1.744) |
| $Cashflow_{i,t}$ | 0.014 | 0.016 | 0.008 | 0.171 | 0.016 | 0.010 |
| | (1.211) | (0.244) | (0.522) | (1.237) | (0.741) | (0.129) |
| $Q_{i,t}$ | 0.001 | 0.004 | 0.004* | -0.005 | -0.003 | 0.008* |
| | (0.848) | (0.926) | (1.946) | (-0.647) | (-0.998) | (1.775) |
| $Size_{i,t}$ | -0.000 | -0.003 | 0.002 | -0.004 | -0.005 | -0.003 |
| | (-0.641) | (-1.566) | (0.782) | (-1.291) | (-1.571) | (-0.947) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.156 | 0.185 | 0.170 | 0.249 | 0.210 | 0.212 |
| N | 2,558 | 1,349 | 1,676 | 703 | 882 | 646 |
| PANEL B: Cash flow sensitivity of cash holdings | | | | | | |
| | Full sample | | Serial SEO firms | | Single SEO firms | |
| | Constrained | Unconstrained | Constrained | Unconstrained | Constrained | Unconstrained |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $CashHold_{i,t-1}$ | -0.373*** | -0.179*** | -0.338*** | -0.184*** | -0.436*** | -0.224*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (-19.42) | (-9.730) | (-13.95) | (-6.867) | (-13.82) | (-7.898) |
| $\Delta Debt_{i,t}$ | -0.262*** | 0.118 | -0.205** | 0.085 | -0.299** | 0.102 |
| | (-3.063) | (0.919) | (-1.996) | (0.434) | (-2.033) | (0.915) |
| $Cashflow_{i,t}$ | 0.189*** | 0.111** | 0.168*** | 0.341*** | 0.230*** | 0.083 |
| | (14.27) | (2.277) | (10.39) | (3.709) | (9.653) | (1.348) |
| $Q_{i,t}$ | 0.003 | 0.002 | 0.004 | -0.011** | -0.001 | 0.009** |
| | (1.385) | (0.509) | (1.329) | (-2.307) | (-0.327) | (2.526) |
| $Size_{i,t}$ | -0.015*** | 0.003* | -0.015*** | 0.009*** | -0.019*** | -0.002 |
| | (-7.276) | (1.926) | (-5.680) | (3.765) | (-4.712) | (-0.898) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.244 | 0.141 | 0.225 | 0.264 | 0.367 | 0.184 |
| N | 2,558 | 1,349 | 1,676 | 703 | 882 | 646 |

Note: This table reports results of 3SLS regressions with year and industry fixed effects (equations 2 and 3) for debt issuance and cash holdings, following the approach of Acharya et al. (2007). The dividend payout ratio (dividends per share / earnings per share) of the issuing firm (per year) is used as a proxy to identify (un)constrained firms. The results are reported for constrained and unconstrained firms for the entire sample of UK firms issuing equity during 1995–2015 (Columns 1 and 2) as well as the subsamples of serial issuers (columns 3 and 4) and single issuers (columns 5 and 6). Firms are considered serial SEO issuers if they conducted more than one SEO in the sample period. Panel A is for cash flow sensitivity of debt and Panel B for cash flow sensitivity of cash holdings.

**Table B3**

Cash flow sensitivity of debt and cash holdings for serial and single issuers: financial constraint proxied by SA index (alternative serial SEO dummy definition).

| PANEL A: Cash flow sensitivity of debt | | | | | | |
|---|---|---|---|---|---|---|
| | Full sample | | Serial SEO firms | | Single SEO firms | |
| | Constrained | Unconstrained | Constrained | Unconstrained | Constrained | Unconstrained |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $Debt_{i,t-1}$ | -0.181*** | -0.184*** | -0.191*** | -0.210*** | -0.201*** | -0.198*** |
| | (-13.84) | (-13.28) | (-10.87) | (-10.80) | (-9.985) | (-9.405) |
| $\Delta CashHold_{i,t}$ | 0.052 | 0.160** | 0.059 | 0.203** | 0.058 | 0.031 |
| | (1.442) | (2.107) | (1.143) | (2.042) | (1.181) | (0.291) |
| $Cashflow_{i,t}$ | 0.009 | 0.075*** | 0.005 | 0.088*** | 0.017 | 0.055 |
| | (0.789) | (3.108) | (0.322) | (2.889) | (0.878) | (1.208) |
| $Q_{i,t}$ | 0.000 | 0.003 | 0.002 | 0.005 | -0.002 | 0.001 |
| | (0.232) | (1.188) | (1.125) | (1.406) | (-0.805) | (0.343) |
| $Size_{i,t}$ | -0.001 | 0.000 | 0.000 | 0.000 | -0.001 | -0.002 |
| | (-0.617) | (0.074) | (0.043) | (0.408) | (-0.519) | (-0.839) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.149 | 0.133 | 0.172 | 0.179 | 0.188 | 0.159 |
| N | 2,685 | 2,601 | 1,532 | 1,509 | 1,153 | 1,092 |
| PANEL B: Cash flow sensitivity of cash holdings | | | | | | |
| | Full sample | | Serial SEO firms | | Single SEO firms | |
| | Constrained | Unconstrained | Constrained | Unconstrained | Constrained | Unconstrained |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $CashHold_{i,t-1}$ | -0.352*** | -0.267*** | -0.332*** | -0.276*** | -0.388*** | -0.297*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (-19.46) | (-16.01) | (-13.29) | (-12.46) | (-14.93) | (-10.88) |
| $\Delta Debt_{i,t}$ | -0.213** | 0.079 | -0.180 | 0.100 | -0.014 | -0.073 |
| | (-2.031) | (1.289) | (-1.325) | (1.354) | (-0.102) | (-0.800) |
| $Cashflow_{i,t}$ | 0.196*** | 0.106*** | 0.173*** | 0.097*** | 0.243*** | 0.169*** |
| | (15.61) | (5.407) | (10.59) | (3.919) | (12.18) | (4.501) |
| $Q_{i,t}$ | 0.004* | 0.003 | 0.004 | 0.003 | 0.002 | 0.004 |
| | (1.800) | (1.271) | (1.332) | (1.078) | (0.467) | (1.229) |
| $Size_{i,t}$ | -0.018*** | -0.003*** | -0.019*** | -0.002 | -0.019*** | -0.003 |
| | (-8.032) | (-2.634) | (-5.888) | (-0.975) | (-5.543) | (-1.571) |
| Industry dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.$R^2$ | 0.247 | 0.149 | 0.233 | 0.165 | 0.367 | 0.189 |
| N | 2,685 | 2,601 | 1,532 | 1,509 | 1,153 | 1,092 |

Note: This table reports the results of 3SLS regressions with year and industry fixed effects (equations 2 and 3) for debt issuance and cash holdings, following the approach of Acharya et al. (2007). The SA (size-age) index developed by Hadlock and Pierce (2010) is used as proxy to identify (un)constrained firms. Firms with above median SA index score are defined as constrained and below median as unconstrained. The results are reported for constrained and unconstrained firms for the entire sample of UK firms issuing equity during 1995–2015 (Columns 1 and 2) as well as the subsamples of serial issuers (columns 3 and 4) and single issuers (columns 5 and 6). Firms are serial SEO issuers if they conducted more than one SEO in the sample period. Panel A is for cash flow sensitivity of debt and Panel B for cash flow sensitivity of cash holdings.